Pruning SJT Items Based on SME Judgments

July 25, 2023

Presented by: Nicholas Howald, HumRRO

Introduction

- SJTs usually do not have a reference to identify the key

- By nature, SJTs are often somewhat subjective

- Even if you know the key, how do you choose the distractors?

Innovative. Responsive. Impactful.

SJT Background

- One component of a credentialing exam assessing several behavioral competencies

- Candidates are asked to select the best response

- Items consist of a short scenario and stem asking what the candidate should do

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Example Item

- SJTs are drafted with 6-10 response options per item

- Final items need one key and three distractors

You have been recently hired to work as a consultant at a large financial services company. During your onboarding, your new manager says that it is normal at the company for junior staff members to forge the signatures of senior staff members on client documents when the senior staff are unavailable. He suggests that you do the same to avoid bothering the senior staff. You know that this is considered unethical at other companies you have worked at. What should you do?
1. Tell your manager that they should stop engaging in this practice.
2. Ask to see the company's code of ethics.
3. Agree to engage in this practice since it is a company norm.
4. Ask if senior staff could be persuaded to change this practice.
5. Tell your manager that this is considered an ethical violation at other companies.
6. Request a meeting with members of senior staff to learn more about this practice.
7. Tell your manager that this practice is not fair to clients.
8. Suggest your manager speak up to senior staff about this practice.

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Collect SME Judgments of Effectiveness

- Collect ratings of options' effectiveness from least 9 SMEs (preferably more)

- Hold a training session with SMEs to explain the ratings and the overall project

Rate the effectiveness of <u>each</u> response option on a scale from 1-7

1	**What you <u>absolutely should not</u> do and may worsen the situation**
2	
3	**What you <u>should not do</u> and would not improve the situation**
4	
5	**What you <u>could do</u> to be helpful but would not significantly improve the situation**
6	
7	**What you <u>should do</u> and would significantly improve the situation**

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Determining the Key

- Calculate mean and standard deviation for each option

Option	Rater #1	Rater #2	Rater #3	Rater #4	Rater #5	Rater #6	Rater #7	Rater #8	Rater #9	Rater #10
1	3	2	4	5	5	3	2	3	4	3
2	4	5	6	5	6	5	4	7	5	3
3	1	1	1	2	2	2	3	1	2	1
4	4	5	4	3	3	6	3	4	5	2
5	5	4	6	7	7	6	6	7	5	4
6	4	3	4	2	2	3	2	3	4	3
7	5	7	6	5	6	6	7	5	5	5
8	3	3	4	3	3	3	2	3	4	3

Determining the Key

- Calculate mean and standard deviation for each option

Option	Rater #1	Rater #2	Rater #3	Rater #4	Rater #5	Rater #6	Rater #7	Rater #8	Rater #9	Rater #10	Mean Effectiveness	SD Effectiveness
1	3	2	4	5	5	3	2	3	4	3	3.40	1.02
2	4	5	6	5	6	5	4	7	5	3	5.00	1.10
3	1	1	1	2	2	2	3	1	2	1	1.60	0.66
4	4	5	4	3	3	6	3	4	5	2	3.90	1.14
5	5	4	6	7	7	6	6	7	5	4	5.70	1.10
6	4	3	4	2	2	3	2	3	4	3	3.00	0.77
7	5	7	6	5	6	6	7	5	5	5	5.70	0.78
8	3	3	4	3	3	3	2	3	4	3	3.10	0.54

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Determining the Key

- Calculate mean and standard deviation for each option

Option	Mean Effectiveness	SD Effectiveness
1	3.40	1.02
2	5.00	1.10
3	1.60	0.66
4	3.90	1.14
5	5.70	1.10
6	3.00	0.77
7	5.70	0.78
8	3.10	0.54

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Determining the Key

- Calculate mean and standard deviation for each option

- Flag option with highest mean as the key

Option	Mean Effectiveness	SD Effectiveness
1	3.40	1.02
2	5.00	1.10
3	1.60	0.66
4	3.90	1.14
5	5.70	1.10
6	3.00	0.77
7	5.70	0.78
8	3.10	0.54

Innovative. Responsive. Impactful.

Determining the Key

- Calculate mean and standard deviation for each option

- Flag option with highest mean as the key

- If more than one option has the highest mean, choose the one with the lowest standard deviation

Option	Mean Effectiveness	SD Effectiveness
1	3.40	1.02
2	5.00	1.10
3	1.60	0.66
4	3.90	1.14
5	5.70	1.10
6	3.00	0.77
7	5.70	0.78
8	3.10	0.54

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Determining the Key

- Calculate mean and standard deviation for each option

- Flag option with highest mean as the key

- If more than one option has the highest mean, choose the one with the lowest standard deviation

- If standard deviations are the same, we randomly choose

Option	Mean Effectiveness	SD Effectiveness
1	3.40	1.02
2	5.00	1.10
3	1.60	0.66
4	3.90	1.14
5	5.70	1.10
6	3.00	0.77
7	5.70	0.78
8	3.10	0.54

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Identifying Distractors

- Transpose data and focus on one key-option pair at a time

Option	Rater #1	Rater #2	Rater #3	Rater #4	Rater #5	Rater #6	Rater #7	Rater #8	Rater #9	Rater #10
1	3	2	4	5	5	3	2	3	4	3
2	4	5	6	5	6	5	4	7	5	3
3	1	1	1	2	2	2	3	1	2	1
4	4	5	4	3	3	6	3	4	5	2
5	5	4	6	7	7	6	6	7	5	4
6	4	3	4	2	2	3	2	3	4	3
7	5	7	6	5	6	6	7	5	5	5
8	3	3	4	3	3	3	2	3	4	3

Innovative. Responsive. Impactful.

Identifying Distractors

- Transpose data and focus on one key-option pair at a time

Option	Rater #1	Rater #2	Rater #3	Rater #4	Rater #5	Rater #6	Rater #7	Rater #8	Rater #9	Rater #10
1	3	2	4	5	5	3	2	3	4	3
2	4	5	6	5	6	5	4	7	5	3
3	1	1	1	2	2	2	3	1	2	1
4	4	5	4	3	3	6	3	4	5	2
5	5	4	6	7	7	6	6	7	5	4
6	4	3	4	2	2	3	2	3	4	3
7	5	7	6	5	6	6	7	5	5	5
8	3	3	4	3	3	3	2	3	4	3

Rater	Option #1	Option #7 (Key)
1	3	5
2	2	7
3	4	6
4	5	5
5	5	6
6	3	6
7	2	7
8	3	5
9	4	5
10	3	5

Innovative. Responsive. Impactful.

HumRRO
HUMAN RESOURCES RESEARCH ORGANIZATION

Identifying Distractors

- Transpose data and focus on one key-option pair at a time

- Conduct dependent-sample one-tailed t-test to determine if the option is statistically significantly less effective than the key

- If it is, the option is a viable distractor

- If it is not, it is a key rival

Rater	Option #1	Option #7 (Key)
1	3	5
2	2	7
3	4	6
4	5	5
5	5	6
6	3	6
7	2	7
8	3	5
9	4	5
10	3	5

$t(9) = 4.44, p < .05$

Identifying Distractors

- Repeat this process for each key-option pair
- We also try to refrain from using options with mean effectiveness below 2

Option	Mean Effectiveness	Option Status
1. Tell your manager that they should stop engaging in this practice.	3.40	Potential distractor
2. Ask to see the company's code of ethics.	5.00	Remove (Key rival)
3. Agree to engage in this practice since it is a company norm.	1.60	Remove if possible (Low mean)
4. Ask if senior staff could be persuaded to change this practice.	3.90	Potential distractor
5. Tell your manager that this is considered an ethical violation at other companies.	5.70	Remove (Key rival)
6. Request a meeting with members of senior staff to learn more about this practice.	3.00	Potential distractor
7. Tell your manager that this practice is not fair to clients.	5.70	Key
8. Suggest your manager speak up to senior staff about this practice.	3.10	Potential distractor

Innovative. Responsive. Impactful.

Identifying Distractors

- Repeat this process for each key-option pair
- We also try to refrain from using options with mean effectiveness below 2

Option	Mean Effectiveness	Option Status
1. Tell your manager that they should stop engaging in this practice.	3.40	Potential distractor
2. Ask to see the company's code of ethics.	5.00	Remove (Key rival)
3. Agree to engage in this practice since it is a company norm.	1.60	Remove if possible (Low mean)
4. Ask if senior staff could be persuaded to change this practice.	3.90	Potential distractor
5. Tell your manager that this is considered an ethical violation at other companies.	5.70	Remove (Key rival)
6. Request a meeting with members of senior staff to learn more about this practice.	3.00	Potential distractor
7. Tell your manager that this practice is not fair to clients.	5.70	Key
8. Suggest your manager speak up to senior staff about this practice.	3.10	Potential distractor

Innovative. Responsive. Impactful.

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Choosing Distractors

- We often have more than 3 viable distractors after this process

- Further considerations for choosing among distractors:

1. **Redundancy**: if two viable distractors have conceptual overlap, only one should be kept

2. **Low quality**: Remove any options that seem relatively unclear or poorly written

3. **Range**: Try to have a range of mean effectiveness ratings in the final options to the extent possible

Pruned Item

You have been recently hired to work as a consultant at a large financial services company. During your onboarding, your new manager says that it is normal at the company for junior staff members to forge the signatures of senior staff members on client documents when the senior staff are unavailable. He suggests that you do the same to avoid bothering the senior staff. You know that this is considered unethical at other companies you have worked at. What should you do?	
1. Tell your manager that they should stop engaging in this practice.	Distractor
4. Ask if senior staff could be persuaded to change this practice.	Distractor
6. Request a meeting with members of senior staff to learn more about this practice.	Distractor
7. Tell your manager that this practice is not fair to clients.	Key

HumRRO.
HUMAN RESOURCES RESEARCH ORGANIZATION

Thank You!

For more information please contact:

Nicholas Howald
nhowald@humrro.org

Ki Ho Kim
kkim@humrro.org

Innovative. Responsive. Impactful.

humrro.org